

Application No.: 10/521,906
Amendment and Response dated January 21, 2009
Reply to Office Action of September 23, 2008
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Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the subject application, and please amend the claims as follows:

Claims 1-16 (cancelled)

Claim 17. (Currently amended): Device for the piece-wise or batch-wise dying refining of pieces of a textile substrate with carbon dioxide ~~a treatment medium~~ under high pressure in a near critical or supercritical state and containing dye particles, comprising:

a substantially cylindrical pressure dye vessel, which is provided with a closable feed aperture for placing the pieces of the textile substrate in said pressure dye vessel;

a pipe system for feeding the carbon dioxide containing said dye particles ~~treatment~~ medium to and discharging it from said pressure dye vessel under high pressure in a near critical or supercritical state during treatment;

wherein

said cylindrical pressure dye vessel is provided on at least one of its two end faces with an aperture that can be closed by a lid, which aperture forms said feed aperture,

said device comprises retaining means for keeping said lid in place in a sealing manner during treatment,

said retaining means comprise a bounding frame that is circumferentially closed, with two interconnected end pieces situated at a distance from each other, which end pieces in a closed position can be slid over said pressure dye vessel and thereby retain said end faces of said pressure dye vessel in its axial direction, and

said pipe system connects to feed means for feeding in said supercritical or near critical carbon dioxide containing said dye particles, and

a cylindrical circumferential wall of said pressure dye vessel is made of composite fibre material which on the inside is coated fluid.

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Claim 18. (Currently amended): Device according to claim 17, in which said lid comprises a cylindrical wall part that in a position closing said feed aperture extends in said axial direction along an inner circumferential wall of said pressure dye vessel,

in which at least one sealing ring is provided between said cylindrical wall part and said inner circumferential wall of said pressure dye vessel, and

in which said sealing ring permits a slide of said lid in said axial direction relative to said inner circumferential wall of said dye pressure vessel.

Claim 19. (Currently amended): Device according to claim 17, in which said lid is provided with a holding part, for the purpose of removing said cylindrical wall part from said pressure dye vessel in said axial direction.

Claim 20. (Previously presented): Device according to claim 17, in which said bounding frame comprises two straight and two arch-shaped parts.

Claim 21. (Previously presented): Device according to claim 20, in which two substantially semi-cylindrical retaining pieces, which in said closed position lie between said arch-shaped parts of said bounding frame and said end faces of said pressure vessel, are provided.

Claim 22. (Previously presented): Device according to claim 17, in which said pipe system opens into said lid.

Claim 23. (Previously presented): Device according to claim 22, in which a slotted opening is provided in said bounding frame, for the accommodation in a sliding manner in said opening of a part of said pipe system opening into said lid.

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Claim 24. (Previously presented): Device according to claim 17, in which said two end faces of the pressure vessel are provided with feed apertures that are closable by lids.

Claim 25. (Previously presented): Device according to claim 17, in which said bounding frame is made of composite material, in particular of fibre-reinforced material.

Claim 26. (Previously presented): Device according to claim 25, in which said bounding frame is made of wound fibre-reinforced material, in particular of wound glassfibre-reinforced plastic.

Claim 27. (Canceled)

Claim 28. (Canceled)

Claim 29. (Currently amended): Method for the piece-wise or batch-wise dyeing refining of pieces of a textile substrate with carbon dioxide ~~a treatment medium~~ under high pressure in a near critical or supercritical state with a device according to claim 17, comprising the following steps:

placing one or more pieces of said textile substrate in said pressure dye vessel;
closing said feed aperture by putting on said lid;
sliding said pressure dye vessel and said bounding frame into each other;
feeding said carbon dioxide containing said dye particles ~~treatment medium~~ to said pressure dye vessel at high pressure in a near critical or supercritical state for a desired cycle time;

after completion of said cycle time sliding said pressure dye vessel and the bounding frame out of each other and opening said lid; and

removing said refined dyed textile substrate from said pressure vessel.

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Claim 30. (Canceled)

Claim 31. (Canceled)

Claim 32. (Previously presented): Use of a device according to claim 17, for the piece-wise or batch-wise refining of pieces of textile substrate with a treatment medium under high pressure in a near critical or supercritical state.

Claim 33. (Currently amended): A device for the piece-wise or batch-wise dying refining of pieces of a textile substrate with carbon dioxide a treatment medium under high pressure in a near critical or supercritical state and containing dye particles, comprising:

a substantially cylindrical pressure dye vessel, which is provided with a closable feed aperture for placing the pieces of the textile substrate in said pressure dye vessel;

a pipe system for feeding the carbon dioxide containing said dye particles treatment medium to and discharging it from said pressure dye vessel under high pressure in a near critical or supercritical state during treatment;

wherein

said cylindrical pressure dye vessel is provided on at least one of its two end faces with an aperture that can be closed by a lid, which aperture forms said feed aperture,

said device comprises retaining means for keeping said lid in place in a sealing manner during treatment,

said retaining means comprise a bounding frame that is circumferentially closed, with two interconnected end pieces situated at a distance from each other, which end pieces in a closed position can be slid over said pressure dye vessel and thereby retain said end faces of said pressure dye vessel in its axial direction, and

said pipe system connects to feed means for feeding in said supercritical or near critical carbon dioxide containing said dye particles, and

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a cylindrical circumferential wall of said pressure dye vessel is made of composite fibre material which on the inside is coated fluid;

said lid comprises a cylindrical wall part that in a position closing said feed aperture extends in said axial direction along an inner circumferential wall of said pressure dye vessel, in which at least one sealing ring is provided between said cylindrical wall part and said inner circumferential wall of said pressure dye vessel, and in which said sealing ring permits a slide of said lid in said axial direction relative to said inner circumferential wall of said pressure dye vessel such that a certain elongation of eh bonding frame in the axial direction can be compensated for by a corresponding axial movement of the lid relative to the inner circumferential wall of the pressure dye vessel when said pressure vessel under high pressure whereby said bonding frame elongates in said axial direction to compensate for said slide of said lid when said pressure vessel under high pressure to dissipate axial pressure forces acting upon said lid.

Claim 34. (Previously presented): Method according to claim 29, in which
said lid comprises a cylindrical wall part that in a position closing said feed aperture extends in said axial direction along an inner circumferential wall of said pressure dye vessel, in which at least one sealing ring is provided between said cylindrical wall part and said inner circumferential wall of said pressure dye vessel, and in which said sealing ring permits a slide of said lid in said axial direction relative to said inner circumferential wall of said pressure dye vessel such that a certain elongation of eh bonding frame in the axial direction can be compensated for by a corresponding axial movement of the lid relative to the inner circumferential wall of the pressure dye vessel when said pressure vessel under high pressure whereby said bonding frame elongates in said axial direction to compensate for said slide of said lid when said pressure vessel under high pressure to dissipate axial pressure forces acting upon said lid.

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Claim 35. (New): Device accordingly to claim 17, wherein the pressure dye vessel and the bounding frame are set up horizontally.

Claim 36. (New): Device accordingly to claim 17, wherein said pressure dye vessel comprises unidirectionally, circumferentially wound fibres.

Claim 37. (New): Device accordingly to claim 17, wherein the composite fibre material of the pressure dye vessel on the inside is coated with a layer of stainless steel.